Claims

1. A DNA molecule which comprises an expression cassette wherein said expression cassette comprises a nucleotide sequence encoding a T-type calcium channel α_1 subunit, said encoding sequence operably linked to control sequences to effect its expression.

2. The DNA molecule of claim 1 wherein said α_1 subunit is α_{1G}, α_{1H}, or α_{1I}.

3. The DNA molecule of claim 2 wherein said α_1 subunit is derived from a mammal.

4. Recombinant host cells modified to contain the DNA molecule of any of claims 1-3.

5. The cells of claim 4 which are mammalian cells.

6. A method to effect production of a functional calcium channel which method comprises culturing the cells of claim 4 or 5 under conditions wherein said functional calcium channels are produced.

7. A method to identify a compound which is a modulator for T-type mammalian calcium channels, which method comprises contacting the cells employed in the method of claim 6 with said compound and assessing the effect of said compound on said cells.

8. A T-type calcium channel modulator identified by the method of claim 7.

9. A method to treat conditions characterized by undesirable levels of T-type calcium channel activity which method comprises administering to a subject in need of such treatment an effective amount of the modulator of claim 8.

10. The method of claim 9 wherein said condition is cardiac hypertrophy, cardiac arrythymia, hypertension, a sleep disorder, or epilepsy.

11. A DNA molecule which comprises an expression system for a nucleotide sequence which is complementary to the nucleotide sequence encoding a T-type calcium channel α_1 subunit or which forms a triple helix with DNA comprising said encoding sequence.

12. A method to treat a condition characterized by an undesirable level of T-type calcium channel activity which method comprises administering to a subject in need of such treatment an effective amount of the DNA molecule of claim 11.

13. The method of claim 12 wherein said condition is cardiac hypertrophy, cardiac arrythmia, hypertension, a sleep disorder, or epilepsy.

14. An oligonucleotide which consists essentially of a nucleotide sequence characteristic of a T-type calcium channel α_1 subunit, said oligonucleotide coupled to or comprising a detectable label.

15. A method to map the distribution of T-type calcium channels in a tissue which method comprises contacting said tissue with the oligonucleotide of claim 14.

16. Antibodies specifically immunoreactive with the extracellular portions of a T-type calcium channel.

17. A method to map the distribution of T-type calcium channels in a tissue which method comprises contacting said tissue with the antibodies of claim 16.